

Studies on Influence of Weather Parameter on the Activity of Soapnut Semilooper Monitored through Light Trap Catches at Devarakonda of Nalgonda District, Telangana

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Abstract: To understand the influence of weather parameters, correlation study made on the number of adults trapped through the light trap and the larval population on soap nut. Total rainfall, minimum temperature and relative humidity (morning and evening) showed significant positive correlation with light trap catches and larval population; where as maximum temperature had significant negative influence on both the parameters. Step down co-relation coefficient suggested that total rainfall, minimum temperature, morning and evening relative humidity are the most important weather parameters which determine the population build-up of *Tinolius eburneigutta*

Keywords: Seasonal incidence, Light trap, Semi looper, Standard week, insect pest.

1. Introduction

Sapindus is a genus of shrubs and small trees in the Sapindaceae family. *Sapindus trifoliatus* are known as soap nut, soap berry, washnut, reetha, aritha, dodan, doani and flourishes well in deep clay loamy soil with an annual rainfall of 150-200 mm. The species, *Sapindus trifoliatus*, occurs in the Western Ghats and plains of South India. This is a deciduous tree and flourishes well in deep clay loamy soil with an annual rain fall of 200 mm. The flowers are small greenish white in color and open during November to January. The fruit is a small leathery-skinned drupe 1-2 cm in diameter. The fruits are solitary globose appears in the month of July-August. The fruit is velvety when young and turns hard and smooth on maturing. The fruits and seeds are slightly smaller than the north Indian species. Fruits of *Sapindus trifoliatus* have been considered as a tonic, stomachic, alexipharmic, astringent and sedative to the uterus and also useful in chronic dysentery, diarrhea, cholera, hemicrania, paralysis and epileptic fits of children. The roots used as a collyrium in sore eyes and ophthalmia. The seeds are employed to stimulate the uterus in childbirth and to increase mensuration.

This study was done to investigate the insect pest of *Sapindus trifoliatus*, is based on increased importance and the recent problems of decreasing productivity and large-scale mortality, there is a need to develop IPM System of the above species of Andhra Pradesh was expressed by Andhra Pradesh Forest Department. Integrated Pest Management is an effective and environmentally sensitive approach to pest management that relies on a combination of common sense practices. The findings of the present study are the consistent with the view that the incidence of the insect pests of target species will be recorded. The problem on the insect pest of target species will be investigated and suggested the possible control measures to counter the present problem. So This study was address the above issues by studying the insect

damage on these trees, and this information is useful to develop an economical and environmentally acceptable pest management programme deserves serious consideration in future research.

2. Method and Materials

A light trap unit/ha made up of Galvanised iron sheet, comprising two main components i. e. funnel shaped trapping device and collection-cum fumigation chamber was installed in Horticulture Research Station Mallepally, Nalgonda Distt for catching adult insect. Mercury Vapor Lamp (MVL) of 160 watts was used as light source for attracting insects. Dichlorvos was kept inside the fumigation chamber in plastic package to kill the trapped insects. The unit was installed at Mallepally (Horticultural research station), Nalgonda distt. which has approximately 250 soapnut plantations. The unit was operated every night from dusk to dawn on next day. The collection of each day samples was considered as a replication.

The meteorological data such as temperature, relative humidity and rainfall of the study area were recorded. The relationship between weather factors, larval population and light trap catches of *T. eburneigutta* moths were computed.

3. Results

The results showed the peak moth catches during April-July. The weather factors viz., rainfall showed significant positive influence and the wind velocity had negative influence on the defoliator occurrence. Adult activity of *T. eburneigutta* as monitored by light trap catches. The adult activity of *T. eburneigutta* was monitored through light trap catches at weekly interval for the years, 2016-17 and 2017-18 and the data are presented in Fig.1-2. During the year 2016-17 the total number of moths caught in the light trap revealed that the activity of moths started from 22nd standard week (Fig.1)

and continued till 42nd standard week. Peak activity of moth was noticed during 25th standard week (107 moths per trap per week) and was stable up to 29th week. The moth population declined to zero on 43rd to 19th standard week. It is interesting to note that in general, the female trapped were more compared o male moths throughout the period of observation (Fig: 1). During 2017-18, the moth activity was first noticed in 22nd standard week and continued rather till 42nd standard week (Fig: 2). The data on the trap catches revealed that the first peak was recorded during 26th standard week (136 moths per trap per week) and continued till 43rd standard week. The moth catches declined considerably thereafter till 41th standard week and became zero from 43rd standard week to 21st standard week (Fig: 2). Interestingly during this year also, the male to female ratio was low in the catches.

Relationship between moth activity and weather parameters

During 2017-18 significantly positive correlation between larval population and total rainfall (r = 0.48), minimum temperature (r=0.33) and evening relative humidity (r = 0.35) was established. Maximum temperature had significant negative correlation (r =-0.43) with larval population (Table 1) The relationship between larval population and weather factors over two years (2016-17 and 2017-18) was found to be highly significant.

Table 1: Correlation between light trap catches of *Tinolius eburneigutta* moths and weather parameters during 2016-2018

Weather parameter	2016-17	2017-18
Total rain fall (mm)	0.90*	0.48*
Max temperature (0c)	-0.22*	-0.43*
Min temperature (0c)	0.21 *	0.33*
Relative humidity (%) (Mor.)	0.24*	0.25**
Relative humidity (%) (Eve.)	0.37*	0.35*

*Significant at p=0.05 ** Significant at p=0.01

4. Discussion

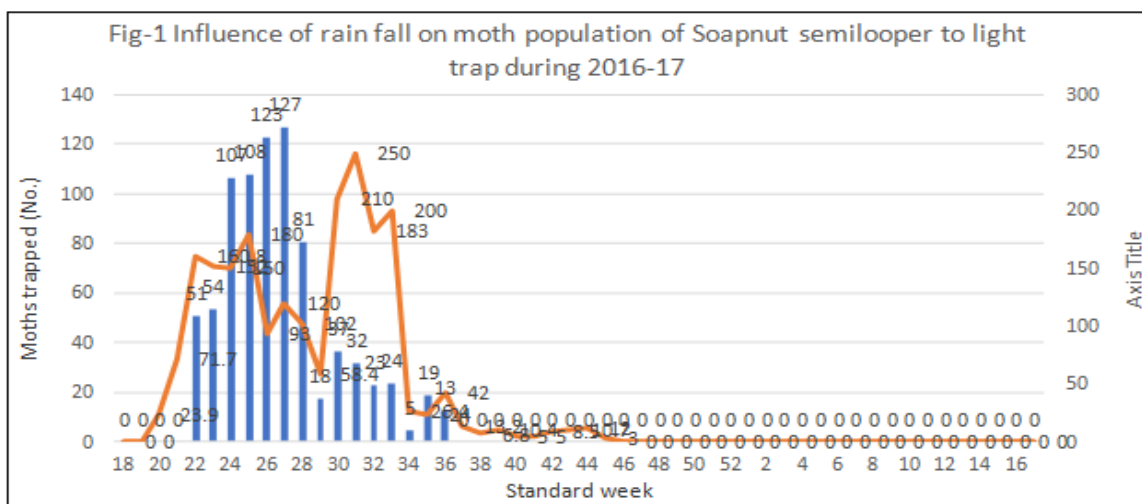
Understanding the correlations of population build-up with weather factors is of prime importance to know the nature of relationship of different weather factors with trap catches. During the present investigation, an attempt was made to establish the relationship between rainfall, maximum and

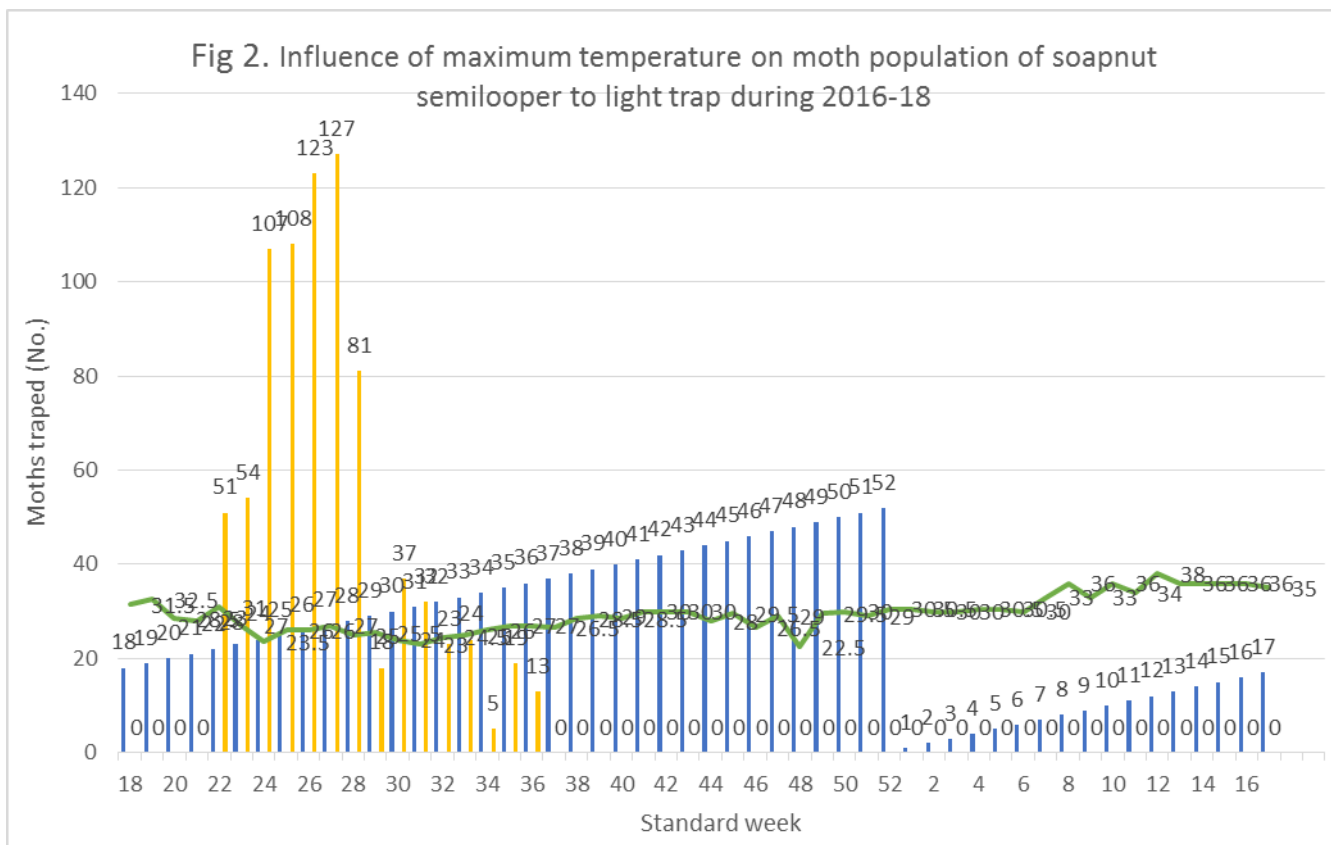
minimum temperatures, morning and evening relative humidity with moth catches through light trap. The salient findings of these investigations are discussed below (Tables 1, 2 and 3). The light trap catches of *T. eburneigutta* moths revealed that weather factors such as rainfall, minimum temperature, morning and evening relative humidity was significantly, positively correlated and maximum temperature was significantly negatively correlated. This association was same in both the years of observations.

The relationship between light trap catches with weather factors over years (2016-17 and 2017-18) indicated that moth catches had significant and positive correlation with rainfall (r=0.90 and 0.48), minimum temperature morning and evening relative humidity (r = 0.21 and 0.33). The maximum temperature was significant and negatively correlated with light trap catches (r =-0.22 and-0.43). The present findings can be comparable with the report of Nair and Sudheendrakumar (1986) and Nair and Mohandas (1996) who have opined that epidemic defoliation occur between late April period. The defoliating larvae during these periods emerge as adult and get trapped during late June and July months.

To decipher the contribution of each of these weather parameters and to identify most significant parameter that influences the population build-up, the step-down multiple regression analysis was employed. The analysis identified the maximum and minimum temperature, morning relative humidity as non-significant parameters influencing light trap catches. The weather factors influenced to a greater extent for the moth catches through light trap (55%).

During the period of study, peak moth catches were noticed coinciding with larvae on soap nut and monsoon season so also succulence of soapnut leaf. Existence of significant correlation between larval population and abiotic factors like rainfall, temperature and relative humidity was observed by Beeson (1941), Mathur (1960) who have opined that the variation in population abundance was influenced by the climate of the locality. These phenomena can be exploited in developing IPM package for monitoring of adult population in soapnut plantation and to avoid subsequent outbreak of this pest.





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